NOTES

As will be seen from another column, the Eclipse Expedition is now fully organised, and all the parties will be on their way before our next number appears. The Organising Committee, who have done about three months' work in a fortnight, deserve all praise for their untiring efforts, and we may hope that they will be adequately rewarded by the results obtained. We may mention that on the representation of the Organising Committee, the Government have communicated with the French and German Governments with a view of securing the services of M. Janssen, who, if he can be got out of Paris, will accompany Mr. Lockyer to Sicily.

It is stated that Prof. H. J. S. Smith, F.R.S., has been appointed to succeed the late Dr. W. A. Miller as a member of the Royal Commission on Scientific Instruction and the Advancement of Science.

The annual election of the Council and officers of the Royal Society took place yesterday, when the following gentlemen were elected, viz.:—President: Gen. E. Sabine, K.C.B. Treasurer: William Spottiswoode, M.A. Secretaries: William Sharpey, M.D.; G. G. Stokes, M.A. Foreign Secretery: Professor W. H. Miller, M.A. Other Members of the Council: George Burrows, M.D.; Heinrich Debus, Ph.D.; P. M. Duncan, M.B.; Sir P. de M. Grey Egerton, Bart.; Prof. G. C. Foster, B.A.; Francis Galton; J. P. Gassiot; J. D. Hooker, C.B, M.D.; William Huggins; Prof. G. M. Humphry, M.D.; J. Gwyn Jeffreys; Sir J. Lubbock, Bart.; C. W. Siemens; Prof. A. J. S. Smith, M.A.;Prof. John Tyndall, LL.D.; and Prof. A. W. Williamson, M.D.

It is with very great regret that we have to announce the disablement of two of our most prominent scientific men. Sir R. I. Murchison has been stricken with an attack of paralysis, and Professor Balfour Stewart was among the sufferers by the collision on the London and North-Western Railway on Saturday evening last. In the latter case, though the injuries are severe, one thigh broken, and a great shock to the nervous system, we may hope that Professor Stewart will shortly be restored to his friends and to science. At the moment of going to press, we hear that Sir R. Murchison's state is considered somewhat improved, and that Sir W. Ferguson reports Prof. Stewart to be going on satisfactorily.

The Anniversary Session of the St. Andrews Medical Graduates Association will be held at the Freemasons' Tavern, Great Queen Street, on Friday and Saturday, December 2nd and 3rd. On Friday, at 7.30 P.M., Dr. Whitmore will read a paper "On the results of Sanitary Legislation on the Health of the Metropolis and our present urgent Sanitary requirements." On Saturday, at 5 P.M., the President, Dr. Richardson, F.R.S., will deliver the Anniversary Address "For the Future of Physic."

At the first ordinary meeting for the session of the Society of Arts, held on the 16th ult., the following silver medals were awarded:—To Mr. Thomas Dickins for his paper "On Silk Supply;" to Mr. James Collins for his paper "On Indiarubber, its History, Commerce, and Supply;" and to Mr. William Bridge Adams for his paper "On Tramways for Streets and Roads and their sequences;" and the Prince Consort's Prize of twenty-five guineas to Mr. Edward Turner Sim, who, at the Society's examination, had obtained during the last four years the largest number of first-class certificates.

Counts H. Wilcjek and G. Wurmbrand have been engaged, at the instance of the Viennese Anthropological Society, in an examination of the Austrian lakes, and have found remains of pile-dwellings in the Attersee. One of them belongs to the Stone period.

At the remote city of Indianapolis an Academy of Sciences has just been formed under the presidency of Professor E. T. Cox. The exclusive object of the association is the cultivation and imparting of knowledge of the natural and physical sciences. Though the number of members at present does not appear to be large, it will, no doubt, like most other things in the Far West, increase rapidly. We wish all success and a prosperous future to this the youngest society for the advancement of natural history.

The recently published volume of Bentham's "Flora Australiensis" (vol. v.) includes the natural orders from Myoporineæ to Proteaceæ.

Messrs. Macmillan will shortly publish, as one of their series of school class-books, Lessons in Elementary Physics, by Prof. Balfour Stewart.

We have just received the first part of the second edition of Schellen's Spectral-analyse. The preface states that it has been carefully revised, and considerable additions made, in accordance with the progress of science since the publication of the first edition, especially in the application of spectrum-analysis to the sun. It is copiously and beautifully illustrated.

The third section of "Husemann's Pflanzenstoffe in chemischer, physiologischer, pharmakologischer, und toxikologischer Hinsicht," does not, as was expected, complete the work. It is occupied with vegetable acids and neutral substances.

Mr. Matthew Williams, jun., has reprinted, from "Essays of the Birmingham Speculative Club," a paper on "The Relation of the Universities to Practical Life." The writer's aim is to assert the claims of experimental science to a higher place in the scheme of English University education. It is monstrous that such a plea should still be necessary. While it remains so, however, we welcome all who, like Mr. Williams, can break a lance in the cause of true progress in such a manner as to appeal even to the most "practical" sympathies. Why should not others in the great centres of English industry take up the subject? Agitation works wonders in the political world; who knows what it might not in time effect for science?

On the 7th of August the most severe shock of earthquake since April 1868, has been felt in the Hawaian Archipelago. The time was $4^{h}\ 10^{m}$ A.M., and the shock was felt generally in Maui, Molokai, and Hawaii, but not so much in Honolulu. The damage done was not so great, but it was considered remarkable that the shock lasted ten seconds—a long period for a single shock. The cause of its diminished violence is attributed to its being vibratory and extremely regular. In Molokai the earthquake was accompanied by a tremendous roar, and appeared to have a circular motion, so that no precise direction could be noticed. It is stated that the fissures on the Kau side of Mauna-loa are constantly steaming, and that smoke is issuing from the crater of Makeaweoweo in great volume.

H.M.S. *Zealous*, bearing the broad pennant of Admiral Farquhar, having visited St. Charles, one of the Galapagos Islands, has found sufficient objects of interest to induce the Admiral to make another trip there in October, to examine the natural history of the place.

On Thursday, the 29th September, two violent shocks of earthquake occurred at Lima, in Peru, about 10 P.M., causing much alarm.

A passenger reports to the *Rangoon Times* a waterspout seen on the Irawaddy River on the 31st of August in the Chwaygeen Creek. He saw a dense mass of clouds, and then a whitish cloud, which resolved itself into a large waterspout. It soon partially dispersed, but formed again, and remained about ten minutes, sometimes straight, at others curved. The convex side was to the wind. The spout appeared to be rapidly skimming the surface of the river, the water rising like spray round it, and having a spiral appearance along the shaft. The phenomenon was not accompanied by noise or thunder and lightning.

WE have received the reports of the Mining Surveyors and Registrars, Victoria, for the quarter ending 30th June, 1870. In some instances steady improvement is reported, but there are also numerous complaints of a considerable falling off in the yield of gold. The total number of miners employed in the colony during the quarter was 60,267. Of these, 28,227 Europeans and 15,478 Chinese were employed as alluvial miners, 16,500 Europeans and 62 Chinese as quartz miners. In alluvial mining 399 steam-engines of 9,657 aggregate horse-power were used in winding, pumping, &c.; and in quartz mining 701 steam-engines, of 13,283 aggregate horse-power. The approximate value of the mining plant was 2,144,727*l*. 1,021½ square miles of auriferous ground were actually worked upon, and 2,782 distinct quartz reefs were actually proved to be auriferous. The Mining Surveyors and Registrars are unable to obtain perfectly full information respecting the quantities of quartz, &c., crushed or operated upon; but the following is a summary of the leading facts which they detail:—The total quantity of quartz crushed was 223,285 tons 14 cwt. 36,909 tons 7 cwt. of quartz tailings, cement, and mullock were crushed, and 868 tons 15 cwt. 2 qrs. of pyrites and blanketings were operated on. The average yield of gold per ton from quartz was 9 dwt. 11-38 gr.; from quartz tailings, cement, and mullock, 3 dwt. 0.39 gr.; from pyrites and blanketings, 2 oz. 6 dwt. 13·37 gr. The total yield of gold from quartz was 105,775 oz. 18 dwt. 19 gr.; from quartz tailings, cement, and mullock, 5,566 oz. 9 dwt. 1 gr.; from pyrites and blanketings, 2,022 oz. 7 dwt. 18 gr. Appended to the reports is a careful geological map of portion of the Durham Lead, with a paper on the subject by Mr. Reginald A. F. Murray. Mr. Murray describes the physical and geological aspects of the district traversed by the Durham Lead, discusses the question whether it is or is not the main outlet of the Golden Point Gutter, and gives a brief account of the claims lying within the portion of the lead immediately under consideration.

IF we may judge from its last annual report, the proceedings of the Bombay Geographical Society are not much enlivened by the efforts of its members. During the entire session not a single member had favoured the Society with any original communication. For some time the Society has been considering the propriety of getting compiled an Anglo-Vernacular Index of Indian Geographical names. The scheme would supply a want that has long been felt, but it does not appear to have received much encouragement from the authorities, to whom an appeal for aid in the matter was addressed. The "Transactions" of the Society for the year ending December 1869, are made up of some interesting notes on Annesley Bay, by Mr. Edwin Dawes, and a brief paper by Mr. J. U. Yajnik, on the Hot Springs of Lasúndrá, in the Kairá Zillá.

ANOTHER proof of the desirability of earnest experiments in the widespread cultivation of economic plants is shown in the success which has attended the introduction of tobacco in some of our own colonies. Samples of Latakia tobacco grown in Jamaica have been submitted for approval in London, and reported upon favourably; and from India we hear that the seeds of the best varieties are being distributed in the districts most suited to the cultivation of the plants. From Natal, a sample has just been received, and submitted to an eminent firm of tobacco brokers in the City, who report that it is a very near approach to what colonial tobacco should be. It is of good substance, and of a fair light brown colour, and would, if carefully packed, in all probability fetch a price of from 5*d*. to 5½*d*. per lb. in bond, and would meet with a ready sale to a rather large extent in the London market. The principal requirements of a good tobacco are brightness of colour and dryness of condition, the latter being most essential in consequence of the high rate of duty. Green and imperfect leaves should be excluded, and great care should be taken in packing, so as not to injure or crush the leaves. An important point in the curing of tobacco is to ensure its burning well, and holding fire. A good opportunity presents itself at the present time for the introduction into our markets of colonial tobacco, owing to the general scarcity both of the continental supplies and of other kinds usually substituted for the American product in the manufacture of cut tobaccos.

AS an instance of the rapidity with which introduced plants spread, when soil and climate are congenial to their habits, we may point to the *Euphorbia prostrata*, Ait, a little annual weed in Jamaica and Trinidad, which became introduced by chance about ten years since into a garden in Madeira, situated some 400 feet above the sea; from this spot it has rapidly spread down the steep road to the town; while up the other hills, separated by deep ravines from that down which it came, it has scarcely crawled at all, a downward course apparently being far easier for it than an upward one. It has, however, slowly crept up another hill at the rate of about ten feet a year. The seeds, which are described as ecarunculate, with sharply tetragonal palæ, transversely keeled, are well adapted for sticking to the clothes of travellers, and to be carried about, so that we might well expect the plant to crop up in all directions. Mr. Lowe says that it is now to be found everywhere in Funchal below 500 feet.

THE pods of the Ground Nut (*Arachis hypogæa*) are frequently to be seen in the windows of small shops in the poor neighbourhoods of our large towns, where they are chiefly purchased by children, and are known to them as "monkey nuts." Their chief use, however, is for the expression from the seeds of a light coloured bland oil, said to be extensively used for mixing with olive oil; and we have even heard of the seeds being parched and used as a substitute for coffee, but we now read that in America they are used for making chocolate (so called); for this purpose they are beaten up in a mortar and the mass compressed into cakes, and it is said to form a most agreeable chocolate without a particle of true cocoa. More than this, the Americans prepare the seeds as a dessert sweetmeat by parching them and beating them up with sugar.

THE disasters of a ship have made the Peruvians acquainted with the situation of a new guano island in the South seas. This is called "Baker's Island," in 12° N. lat. and 176° E. long. It has some smaller islands near, and is surrounded by coral reefs, on which thirty wrecks have been counted. The island has been taken possession of by a North American company, and is peopled by three Americans, of whom one is the governor, and about a hundred Kanakas. The cargo of the English barque *Borneo*, bound to London, consisted of a yellowish earth, which the Peruvians say has no smell of ammonia, but may sell at a profit to mix with Peruvian guano.

THE *Boston Journal of Chemistry* says that large factories have been established in New Orleans, Buffalo, and Brooklyn, or making grape sugar from corn. The latter is steeped in weak soda lye, for the purpose of softening the husk and gluten; and is then ground wet, and run through revolving sieves to separate impurities. It is afterwards made to flow through ways or troughs, in which the starch gradually settles as a white powder. The wash water is run into a large cistern, and allowed to ferment and produce a weak vinegar. The starch from the troughs is put wet into the mash-tub, and treated with water containing one per cent. of sulphuric acid, for eight hours. The acid is neutralised with chalk or carbonate of lime, and the liquid evaporated to get rid of the gypsum, and afterwards further evaporated in vacuum pans, and run into barrels ready for crystallisation.

MATERIAL changes are officially reported from the Bay of Talcahuano, in Chile, which was surveyed by Captain Fitzroy. The commander of the Chilean war steamer *Ancud* now reports that the water throughout the entire extent of the bay has increased from two to two-and-a-half fathoms. This represents great geological change. The rock Fraile, in the Gulf of Arauco, represented on Fitzroy's chart as a sunken rock, is now, however, a small island united to the mainland, opposite to the western bank of the river Tubul, and has rather the shape of a quadrangular pyramid.

THE *Times of India* states that the coal-beds discovered in Bellary are excellent in quality and abundant in quantity. Great anxiety is felt for Dr. Oldham, who said he would eat all the coal found in the Madras Presidency, for the doctor is a man of honour.

FROM a considerable number of observations on the temperatures of the two sides of the body, Mr. Blake draws the following conclusions, which are recorded in the *Medical Times and Gazette* of October 8, 1870:—1. That the temperature of the sides of the trunk under usual circumstances, *i.e.* in health and at rest in a temperate climate, is equal. 2. That under certain conditions the temperature of the left side of the trunk may exceed that of the right. 3. That that excess during exertion in a cool atmosphere averages half a degree F. 4. That that excess reaches its maximum of about one degree F. during exertion under a powerful sun.

*THE GEOGRAPHICAL DISTRIBUTION OF DEER**

IN his excellent "Geographische Mittheilungen," Dr. Petermann has lately given us several *zoo-geographical* articles, as we may call them—such as those of Dr. Finsch on the distribution of Parrots, and of Freiherr von Heuglin on the Bird-fauna of North-eastern Africa. Both of these memoirs are the products of the highest authorities on the subjects to which they respectively relate, and deserve our warmest commendation. We cannot, however, say so much as to the merit of the paper upon the Geographical Distribution of Deer, which appears in a recent number of Dr. Petermann's journal. The authors of this memoir, which, if properly treated, is on a subject of very great interest, have, we fear, commenced to indulge in "generals" before having sufficiently got up their "particulars." In the first part of their essay they point out the present distribution of the different genera and species of *Cervidæ* over the world's surface, and endeavour to show how they have descended from a common ancestral form. This form they imagine must have been the *Moschidæ*, upon the ground that in order to obtain a deer with horns we must pre-suppose the existence of a deer without horns, and the *Moschidæ* answer this definition. Unfortunately, however, the authors have not yet discovered that their so-called group *Moschidæ* is composed of two forms of animal life that have very little to do with one another. It has been shown most conclusively by the researches of M. Alphonse Milne-Edwards† in Paris, and Prof. Flower in our own country,‡ that the *Chevrotains* (*Tragulus* and *Hyomoschus*), one of the constituents of the *Moschidæ* of MM. Jaeger and Bessels, constitute a family *per se*, quite distinct from the rest of the ruminants, and connecting them with the pigs, and consequently quite distinct from the musk-deer (*Moschus*). In the same way our authors base certain arguments upon the fact of all the typical deer being spotted in the immature state. But, as Dr. Jaeger at least—having been, if we are not misinformed, custos of a zoological garden—ought to know, this is not quite the case, all the *Rusine* deer having their young spotless. Again, arguments are founded upon *Cervus pudu* of Chili living in the Cordilleras, and the other allied species with simple unbranched horns in the plains of South America. But exactly the contrary is the case. *Cervus pudu* is from the low maritime coast of Chili, and one, if not more, of the so-called "*Subulones*" (*C. rufus*) lives high in the Andes of Venezuela and New Granada. From these and other similar instances of erroneous statements which it would be easy to point out, it is, in fact, quite obvious that the authors of this essay have no very special acquaintance with the group upon the distribution of which they treat. We leave it to naturalists to decide whether, under these circumstances, the results arrived at are worthy of much attention. Their theory seems to be that the deer-family reached the New World by an Arctic continent which formerly connected northern Europe with eastern America, and which Dr. Jaeger, in a former paper, has proposed to call "*Arctis*." There are, however, if we are not mistaken, equally good grounds for believing that the numerous, undoubtedly Old-world forms in North America reached it by immigration from North-western Asia.

HENDERSON'S PATENT STEEL PROCESS

TWO articles written by Mr. W. Mattieu Williams, called "Papers on Iron and Steel—A Costly and Vexatious Fallacy," were published a short time since in NATURE. These papers are considered in this country to be the clearest and ablest that have ever appeared on this subject, setting forth the reason why all efforts heretofore made to produce steel from English cast-iron by partial decarbonisation have failed; that all manipulations have been directed to removing as much as possible the impurities contained in pig iron by oxidation. He was not aware that new agents have been used, combined with oxygen, and that patents had been granted therefor in England, Nos. 318, 1,051, A.D. 1870 (which were not then published) for combining fluorine with oxygen, and fluorine combined with titanic acid, or with titanium and oxygen.

The new patent process for the production of steel by the partial decarbonisation of cast-iron consists in the combined use of fluorspar or other fluorides and titanic acid, applied to cast-iron at the melting temperatures, preferably in reverberatory furnaces. Fluorine is given off from the fluorspar, and is a more powerful agent for the removal of silicon than oxygen, and removes it almost entirely from the cast-iron before the reactions with the carbon begin; the phosphorus and sulphur are next acted upon and removed in the order they are named by means of the combined action of fluorine and titanic acid or fluorine, titanium, and oxygen, and lastly the carbon is removed. The fluorine is derived from fluorspar combined with iron ores containing titanic acid in such wise as ensures simultaneous action of the fluorine, titanium, and oxygen upon the cast-iron; and by reason of the affinities of these substances for silicon, phosphorus, sulphur, manganese, arsenic and carbon, these substances are taken from the iron in the form of vapour and slag, leaving the purified metal in the condition to be hammered or rolled as merchantable steel.

English pig-iron may be made direct into steel by the new process; and with the large class of irons smelted from hæmatites and specular ores with good fuel, *pure*

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* 'Die Geographische Verbreitung der Hirsche mit bezug auf die Geschichte der Polar-länder." Von Gustav Jaeger und Emil Bessels. (Petermann's Geographische Mittheilungen, 1870.)

† "Recherches Anatomiqueset Palæontologiques sur la famille des Chevrotains," Paris, 1864.

‡ "Notes on the Visceral Anatomy of *Hyomoschus aquetocus*." Proc. Zool. Soc., 1867.